IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: **Brokenshire et al.**

Serial No.: **09/833,348**

Filed: **April 12, 2001**

For: **Method and Apparatus for Generating Gamma Corrected Antialiased Lines**

§ Group Art Unit: **2672**
§
§ Examiner: **Amini, Javid A.**
§
§ Attorney Docket No.: **AUS920010010US1**
§

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By: Dell Whitton
Dell Whitton

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ENCLOSED HEREWITH:

- Petition to Withdraw Holding of Abandonment;
- Copy of Notice of Appeal filed on December 19, 2003;
- Copy of PTO Auto-Reply Facsimile Transmission showing receipt of Notice of Appeal filed on December 19, 2003;
- Copy of Appeal Brief mailed on February 19, 2004;
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- Our return postcard.

No fees are believed to be necessary. If, however, any fees are required, I authorize the Commissioner to charge these fees which may be required to IBM Corporation Deposit Account No. 09-0447.

Respectfully submitted,

Duke W. Yee
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ATTORNEY FOR APPLICANTS

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application: **Brokenshire et al.**	§	
Serial No.: **09/833,348**	§	Group Art Unit: **2672**
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By: Dell Whitton
Dell Whitton

PETITION TO WITHDRAW HOLDING OF ABANDONMENT
NOTICE OF APPEAL AND APPEAL BRIEF FILED

I hereby petition to withdraw the holding of abandonment in this case, on the basis that a Notice of Appeal was timely filed on December 19, 2003 and an Appeal Brief was timely filed on February 19, 2004.

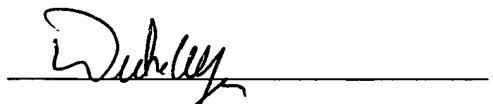
I attach a copy of the following:

1. Copy of the Notice of Appeal with Transmittal filed on December 19, 2003;
2. Copy of PTO Auto-Reply Facsimile Transmission showing receipt of Notice of Appeal filed on December 19, 2003;
3. Copy of Appeal Brief mailed on February 19, 2004; and
4. Copy of PTO stamped postcard showing receipt of Appeal Brief mailed on February 19, 2004.

In consideration of these submissions, it is respectfully requested that the holding of abandonment be withdrawn and an examiner's answer be forthcoming so that we may respond in a timely manner.

No fees are believed to be necessary. If, however, any fees are required, I authorize the Commissioner to charge these fees which may be required to IBM Corporation Deposit Account No. 09-0447.

Respectfully submitted,



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Dec 19 03 10:34a Krista Douthitt 972-367-2002 p.1

Carstens, Yee & Cahoon, L.L.P.

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Re: Application No. 09/833,348 Attorney Docket No: AUS920010010US1	
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: **Brokenshire et al.**	§	Group Art Unit: **2672**
Serial No.: **09/833,348**	§	Examiner: **Amini, Javid A.**
Filed: **April 12, 2001**	§	Attorney Docket No.: **AT9-99-521**
For: **Method and Apparatus for Generating Gamma Corrected Antialiased Lines**	§	

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A fee of $330.00 is believed to be necessary. Please charge this fee to IBM Corporation Deposit Account 09-0447. In the event that any additional fees are required for the prosecution of this application, please charge any necessary fees to IBM Corporation Deposit Account 09-0447. No extension of time is believed to be necessary. If, however, an extension of time is needed, the extension is requested and the fee for this extension should be charged to IBM Corporation Deposit Account 09-0447.

Respectfully submitted,

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ATTORNEY FOR APPLICANTS

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: **Brokenshire et al.**

Serial No.: **09/833,348**

Filed: **April 12, 2001**

For: **Method and Apparatus for Generating Gamma Corrected Antialiased Lines**

§ Group Art Unit: **2672**
§
§ Examiner: **Amini, Javid A.**
§
§ Attorney Docket No.: **AT9-99-521**
§

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By: K Douthitt
Krista Douthitt

NOTICE OF APPEAL

Commissioner for Patents
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Sir:

Applicant hereby appeals to the Board of Patent Appeals and Interferences from the office action dated September 24, 2003 finally rejecting claims 1-23.

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Respectfully submitted,

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ATTORNEY FOR APPLICANTS

Received in the Patent and Trademark Office

INVENTOR: **Brokenshire et al.**

TITLE: **Method and Apparatus for Generating Gamma Corrected Antialiased Lines**

Enclosed:
1. Transmittal Document (in duplicate); and
2. Appeal Brief (in triplicate).

Client: **IBM Corporation**
Serial No. **09/833,348**
Docket No. **AUS920010010US1** Date Mailed: **February 19, 2004**
DWY/clp

Received in the Patent and Trademark Office

INVENTOR: **Brokenshire et al.**

TITLE: **Method and Apparatus for Generating Gamma Corrected Antialiased Lines**

Enclosed:
1. Transmittal Document (in duplicate); and
2. Appeal Brief (in triplicate).

Client: **IBM Corporation**
Serial No. **09/833,348**
Docket No. **AUS920010010US1** Date Mailed: **February 19, 2004**
DWY/clp

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Re application of: **Brokenshire et al.**	§	Group Art Unit: **2672**
Serial No.: **09/833,348**	§	Examiner: **Amini, Javid A.**
Filed: **April 12, 2001**	§	Attorney Docket No.: **AUS920010010US1**
For: **Method and Apparatus for Generating Gamma Corrected Antialiased Lines**	§	

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By: Carrie Parker
Carrie Parker

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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:
ENCLOSED HEREWITH:

- Appellant's Brief (in triplicate) (37 C.F.R. 1.192); and
- Our return postcard.

A fee of $330.00 is required for filing an Appellant's Brief. Please charge this fee to IBM Deposit Account No. 09-0447. No additional fees are believed to be necessary. If, however, any additional fees are required, I authorize the Commissioner to charge these fees which may be required to Deposit Account No. 09-0447. No extension of time is believed to be necessary. If, however, an extension of time is required, the extension is requested, and I authorize the Commissioner to charge any fees for this extension to Deposit Account No. 09-0447.

Respectfully submitted,

Duke W. Yee
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ATTORNEY FOR APPLICANTS

Docket No. AUS920010010US1

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: **Brokenshire et al.**	§	
	§	Group Art Unit: **2672**
Serial No. **09/833,348**	§	
	§	Examiner: **Amini, Javid A.**
Filed: **April 12, 2001**	§	
	§	
For: **Method and Apparatus for Generating Gamma Corrected Antialiased Lines**	§	

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By: Carrie Parker
Carrie Parker

APPELLANT'S BRIEF (37 C.F.R. 1.192)

This brief is in furtherance of the Notice of Appeal, filed in this case on December 19, 2003.

The fees required under § 1.17(c), and any required petition for extension of time for filing this brief and fees therefore, are dealt with in the accompanying TRANSMITTAL OF APPEAL BRIEF.

This brief is transmitted in triplicate. (37 C.F.R. 1.192(a))

REAL PARTIES IN INTEREST

The real party in interest in this appeal is the following party: International Business Machines Corporation.

RELATED APPEALS AND INTEREERENCES

With respect to other appeals or interference's that will directly affect, or be directly affected by, or have a bearing on the Board's decision in the pending appeal, there are no such appeals or interferences.

STATUS OF CLAIMS

A. TOTAL NUMBER OF CLAIMS IN APPLICATION

Claims in the application are: 23

B. STATUS OF ALL THE CLAIMS IN APPLICATION

1. Claims canceled: None
2. Claims withdrawn from consideration but not canceled: None
3. Claims pending: 1-23
4. Claims allowed: None
5. Claims rejected: 1-23

C. CLAIMS ON APPEAL

The claims on appeal are: 1-23

STATUS OF AMENDMENTS

No amendments have been filed subsequent to the close of prosecution.

SUMMARY OF INVENTION

The present invention provides an improved method, apparatus, and computer implemented instructions for generating antialiased lines for display in a data processing system. (Summary, p. 4,

lines 5-8.) A gamma correction is applied to the graphics data on a per primitive basis to form an antialiased line. (Summary, p. 4, lines 12-13.) In other words, only pixels generated for the line are adjusted. (Summary, p. 4, lines 13-15.) The gamma-corrected antialiased line is displayed. (Summary, p. 4, lines 15-16.)

ISSUES

The issues on appeal are as follows:

(1) Whether claims 1-7, 13-18, 19-20, 22, and 23 are unpatentable under 35 U.S.C. §102(e) as anticipated by Warren et al., USPN 6,304,300 B1 (hereinafter "Warren"); and

(2) Whether claims 9, 10, and 21 are unpatentable under 35 U.S.C. §103(a) as obvious over Warren in view of Deering et al., US patent application publication US2001/0055025 A1; and

(3) Whether claims 8, 11, and 12 are unpatentable under 35 U.S.C. §112, first paragraph, as based on a disclosure which is not enabling.

GROUPING OF CLAIMS

The claims do not stand or fall in a single group. Instead, the claims fall into two groups. Group A includes claims 1-7, 9-10, 13-23; and group B includes claims 8, 11, and 12. Claims 8, 11, and 12 are separated into their own group because they have not been rejected over any cited reference and have been rejected only as based on a non-enabling disclosure.

ARGUMENT

I. 35 U.S.C. § 102(e), Anticipation, Claims 1-7, 9-10, 13-23 (Group A)

In rejecting the claims, Examiner states:

> "A method in a data processing system for antialiasing lines for display, the method comprising: receiving graphics data for display, wherein the graphics data includes primitives defining lines; applying a gamma correction to the graphics data on a per primitive basis to form the antialiased lines, wherein the gamma correction is applied only to the primitives defining lines; and displaying the antialiased lines", as applicant in the specification page 2, lines 5-10, discloses a primitive is a graphics element that is used as a building block for creating images, such as, a point, a line, a polygon, or text. Warren et al. in Fig. 9 and in (col. 10, lines 51-54) teach the pixel data is then sent to the rasterization unit 906, where Z-buffering, blending, texturing, and antialiasing functions are performed. And also discloses in abstract that the gamma correction curve table includes a

specified total number of intensity levels associated with gamma corrected pixel values with one intensity level per pixel value. The method includes partitioning the gamma correction curve table into N segments such that each of the N segments is associated with a set of intensity levels from the specified total number of intensity levels. Also see (col. 9, lines 44-65) The geometry unit 902 converts the graphical data from the processor 804 into a screen coordinate system and performs rejection and transformation processes to give depth to a displayed object. The resulting primitives (points, lines, polygons, polyhedra, and the like) supplied by the geometry unit 902 are then provided to the scan conversion unit 904.

Office action of 9/24/03, pages 3-4.

1. **The cited reference, Warren, does not teach all claimed limitations.**

A prior art reference anticipates the claimed invention under 35 U.S.C. § 102 only if every element of a claimed invention is identically shown in that single reference, arranged as they are in the claims. *In re Bond*, 910 F.2d 831, 832, 15 U.S.P.Q.2d 1566, 1567 (Fed. Cir. 1990). In the present cast, the Examiner has failed to cite a reference teaching or suggesting the claim limitation of, "wherein the gamma correction is applied only to the primitives defining lines," as claimed in, for example, claim 1. Claim 1 is reproduced for discussion:

1. A method in a data processing system for antialiasing lines for display, the method comprising:

receiving graphics data for display, wherein the graphics data includes primitives defining lines;

applying a gamma correction to the graphics data on a per primitive basis to form the antialiased lines, wherein the gamma correction is applied only to the primitives defining lines; and

displaying the antialiased lines.

It is respectfully submitted that the cited reference (Warren et al.) does not teach or suggest applying a gamma correction to the graphics data on a per primitive basis to form the antialiased lines, as claimed. More specifically, it is respectfully submitted that Warren does not teach the claimed limitations of, "wherein the gamma correction is applied only to the primitives

defining lines," as claimed in at least claim 1.

Warren explicitly teaches away from the present invention, because it teaches that gamma correction is applied to all primitives. To the contrary, the present invention teaches that gamma correction is applied only to primitives defining lines.

There are several advantages to the present invention not obtained from the teaching of Warren. For example, by applying gamma correction to all primitives, color intensity dampening occurs, as is typical in gamma correcting systems. Further, by not applying gamma correction to all pixels, and by only applying it to primitives that define lines, computational advantages are gained by the teaching of the present invention. Warren, however, explicitly teaches away from such advantages by teaching that gamma correction is applied to all pixels, regardless of the resulting primitive.

Warren is directed to a system for partitioning a gamma correction table into segments, each segment corresponding to a particular intensity level or range of intensity levels. For example, col. 3, lines 9-26, state:

> The gamma correction curve table includes a specified total number of intensity levels associated with gamma corrected pixel values, with one intensity level per pixel value. The method includes partitioning the gamma correction curve table into N segments such that each of the N segments is associated with a set of intensity levels from the specified total number of intensity levels. A plurality of intensity levels is selected for each of the N segments. The intensity levels are preferably selected such that significant banding effects are not visible to the human eye between an adjacent pair of selected intensity levels. The gamma corrected pixel values are stored for each of the N segments such that each of the plurality of selected intensity levels functions as an index to the associated gamma corrected pixel values. Gamma correction is performed on the set of pixel data by accessing a stored pixel value in one of the N segments in response to the pixel data, to generate gamma corrected pixel data.

This passage depicts a gamma correction table with multiple segments, but it does not teach the claimed limitation of, "wherein the gamma correction is applied only to the primitives defining lines," as claimed in at least claim 1. To the contrary, it appears that Warren, like other conventional gamma correction systems, applies gamma correction to all pixel values and not just to those forming lines. In other words, the segmented gamma correction table of Warren applies its correction to all pixels, thus failing to achieve the advantages of the present invention, which include avoiding color intensity dampening that occurs with typical gamma corrections. It

also fails to obtain the computational advantages of not applying gamma correction to all pixels.

Examiner cites Warren at FIG. 9 and col. 9, lines 44-65. Col. 10 describes FIG. 9, and is partially reproduced here, at col. 10, lines 44-65:

> FIG. 9 illustrates a more detailed block diagram of the graphics subsystem 812 in accordance with one embodiment of the present invention. The object data is processed by graphics subsystem 812 in the following pipelined stages: a geometry unit 902, a scan conversion unit 904, a rasterization unit 906, a frame buffer 908, and a display unit 910. The geometry unit 902 covers the graphical data from the processor 804 and into a screen coordinate system and performs projection and transformation processes to give depth to a displayed object. The resulting primitives (points, lines, polygons, polyhedra, and the like) supplied by the geometry unit 902 are then provided to the scan conversion unit 904. The scan conversion unit 904 generates pixel data based on the received primitives by interpolating straight lines so that each intermediate value need not be individually and separately calculated by the geometry subsystem. The pixel data is then sent to the rasterization unit 906, where Z-buffering, blending, texturing, and antialiasing functions are performed. The resulting pixel values are subsequently stored in the frame buffer 908. The display unit 910 reads the frame buffer 908 directly or via a rasterization unit 906 and transmits the pixel values to the display device 822 for display.

[Warren, col. 10, lines 44-65.]

This passage depicts Warren's graphics subsystem, but fails to disclose or suggest the limitations of claim 1, namely, "wherein the gamma correction is applied only to the primitives defining lines...." This feature is mentioned in the present disclosure, for example, at page 12, lines 1-5:

> The mechanism of the present invention avoids color intensity dampening that occurs with presently available techniques by applying gamma corrections only to the pixels generated for the line by rasterization engine 308.

No teaching or suggestion that gamma correction is only applied to pixels, fragments, or primitives that are part of a line is found in Warren.

Hence, it is respectfully submitted that claim 1 is distinguished form the cited reference. Further, independent claims 7, 13, 19, 20, and 22 include limitations similar to claim 1, and are thereby respectfully believed distinguished from the cited reference. Also, because of their

dependence on allowable claims, it is respectfully submitted that all dependent claims are allowable. Hence, all claims of Group A are now believed distinguished from the cited reference. Favorable reconsideration of the claims is respectfully requested.

2. With respect to claims 8, 11, and 12, Applicant respectfully submits that these claims are enabled by the specification.

Applicant respectfully submits that Claims 8, 11, and 12 are enabled by the specification. More importantly, Applicant interviewed Examiner on two separate occasions with respect to this rejection, and on both occasions Examiner agreed that the rejection was improper. However, this acceptance by Examiner was not reflected in the Office actions sent to Applicant.

First, Applicant addressed this issue in the response dated 7/01/03. That response documented the interview with Examiner Amini conducted 6/23/03. In that interview, as described in the aforementioned response, Examiner Amini agreed that the rejection of claims 8, 11, and 12 under 35 USC §112 first paragraph was improper, and instructed Applicant to reference that agreement in the reply. Applicant followed Examiner Amini's instructions, as shown in the response dated 7/01/03.

However, in the next Office action, which was final and dated 9/24/03, Applicant noted claims 8, 11, and 12 were again rejected under 35 USC §112 first paragraph. Applicant conducted a second interview with Examiner Amini, this time on 10/16/03. In that interview, Examiner again agreed that the rejection of claims 8, 11, and 12 as not enabled was improper, and instructed Applicant to "ignore" the rejection and to refer to the interview of Oct. 16 2003 in Applicant's response to the final Office action. Applicant followed Examiner's instructions, but also submitted arguments in that response as to why claims 8, 11, and 12 were enabled by the specification.

To wit, Applicant respectfully submits that claim 8's elements, including, "wherein the bus system includes a primary bus and a secondary bus" is enabling. This claim language is supported in the specification at, for example, page 8, lines 5-26, which describes multiple busses, including an expansion bus and a PCI local bus.

Claim 11's limitation of, "wherein the communications unit is an Ethernet adapter," is also enabling, as agreed by the Examiner in the telephone interview.

Finally, claim 12's language of, "wherein the processor unit and memory is located in a

graphics adapter," is also enabling. For example, Examiner states in the office action on page 12, "Note: most of graphics adapters are equipped with processor unit and memory chips." Hence, it is respectfully submitted that claim 12 is enabling, as agreed in the interviews referenced above.

The test for enablement is whether the specification teaches those skilled in the art how to make and use the claimed invention without undue experimentation. *In re Vaeck*, 947 F.2d 488, 495, 20 U.S.P.Q.2d 1438, 1444 (Fed. Cir. 1991); *In re Wands*, 858 F.2d 731, 736-37, 8 U.S.P.Q.2d 1400, 1404 (Fed. Cir. 1988). A specification need not teach what is well-known in the art. *Lindemann Machinenfabrik GMBH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 1463, 221 U.S.P.Q. 481, 489 (Fed. Cir. 1984); *In re Myers*, 410 F.2d 420, 424, 161 U.S.P.Q. 668, 671 (CCPA 1969); *Staehelin v. Secher*, 24 U.S.P.Q.2d 1513, 1516 (Bd. Pat. App. & Int. 1992).

With respect to claims 8, 11, and 12, Applicant respectfully submits that the present specification teaches those skilled in the art to make and use the claimed invention without undue experimentation.

Further, on p. 2 of the Office action dated 9/24/03, Examiner states:

> Examiner agreed to remove the rejection if Applicant submits an explanation for claims 8, 11, and 12. The explanation should explicitly emphasize:
>
> 1. The advantages of primary bus and secondary bus over prior art?
> 2. What are the advantages having (NIC), while the claim 7 discloses "a data processing system"?
> 3. What are the characteristics of processor unit and memory that is located in a graphics adaptor?

Applicant respectfully submits that, with respect to (1.) above, the advantages of a primary bus and secondary bus over prior art are irrelevant to the question of enablement. The test for enablement is whether the specification teaches those skilled in the art how to make and use the claimed invention without undue experimentation. With respect to (2.) above, Applicant again respectfully submits that any advantages to the claim limitations are irrelevant to the question of enablement. Further, Applicant does not understand the reference to "(NIC)" and claim 7. Claim 11 states:

> 11. The data processing system claim 7, wherein the communications unit is an Ethernet adapter.

Applicant respectfully submits that Ethernet adapters are generally understood by those of ordinary skill in the arts.

With respect to (3.) above, claim 12 states:

> 12. The data processing system of claim 7, wherein the processor unit and memory is located in a graphics adapter.

Applicant respectfully submits that claim 12 is enabling. Locating a processor and memory in a graphics adapter is generally understood by those in the art, and stating the specific characteristics of the processor and memory (*e.g.*, processor speed and memory size) is not necessary to enable one of ordinary skill in the art to make and use the claimed invention.

Therefore, the objection of the specification and claims 8, 11, and 12 under 35 U.S.C. § 112, first paragraph has been overcome. It is noted that claims 8, 11, and 12 are not rejected over any cited reference. Therefore, Applicant respectfully submits that claims 8, 11, and 12 are in condition for allowance.

For the above reasons, it is respectfully requested that all rejections made by Examiner be reversed.

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APPENDIX OF CLAIMS

The text of the claims involved in the appeal are:

1. (Previously Presented) A method in a data processing system for antialiasing lines for display, the method comprising:

receiving graphics data for display, wherein the graphics data includes primitives defining lines;

applying a gamma correction to the graphics data on a per primitive basis to form the antialiased lines, wherein the gamma correction is applied only to the primitives defining lines; and

displaying the antialiased lines.

2. (Original) The method of claim 1, wherein the gamma correction is performed using a gamma correction table.

3. (Original) The method of claim 1, wherein the gamma correction is performed using a gamma correction function.

4. (Original) The method of claim 2, wherein the gamma correction table is specified by an application and loaded into a graphics subsystem processing the graphics data for display within the data processing system.

5. (Original) The method of claim 3, wherein the gamma correction function is specified by an application and loaded into a graphics subsystem processing the graphics data for display within the data processing system.

6. (Original) The method of claim 1, wherein the applying step comprises:

adjusting intensity of pixels defining the primitives.

7. (Previously Presented) A data processing system comprising:

a bus system;

a communications unit connected to the bus, wherein data is sent and received using the communications unit;

a memory connected to the bus system, wherein a set of instructions and data including a gamma correction table are located in the memory; and

a processor unit connected to the bus system, wherein the processor unit executes the set of instructions to receive graphics data for display, wherein the graphics data includes primitives defining lines; apply a gamma correction to the graphics data on a per primitive basis to form antialiased lines, wherein the gamma correction is applied only to the primitives defining lines; and display the antialiased lines.

8. (Original) The data processing system of claim 7, wherein the bus system includes a primary bus and a secondary bus.

9. (Original) The data processing system of claim 7, wherein the processor unit includes a single processor.

10. (Original) The data processing system of claim 7, wherein the processor unit includes a plurality of processors.

11. (Original) The data processing system claim 7, wherein the communications unit is an Ethernet adapter.

12. (Original) The data processing system of claim 7, wherein the processor unit and memory is located in a graphics adapter.

13. (Previously Presented) A data processing system for antialiasing lines for display, the data processing system comprising:

receiving means for receiving graphics data for display, wherein the graphics data includes primitives defining lines;

applying means for applying a gamma correction to the graphics data on a per primitive basis to form the antialiased lines, wherein the gamma correction is applied only to the primitives defining lines; and

displaying means for displaying the antialiased lines.

14. (Original) The data processing system of claim 13, wherein the gamma correction is performed using a gamma correction table.

15. (Original) The data processing system of claim 13, wherein the gamma correction is performed using a gamma correction function

16. (Original) The data processing system of claim 14, wherein the gamma correction table is specified by an application and loaded into a graphics subsystem processing the graphics data for display within the data processing system.

17. (Original) The data processing system of claim 15, wherein the gamma correction function is specified by an application and loaded into a graphics subsystem processing the graphics data for display within the data processing system.

18. (Original) The data processing system of claim 13, wherein the applying means comprises:

means for adjusting intensity of pixel defining the primitives.

19. (Previously Presented) A computer program product in a computer readable medium for antialiasing lines for display, the computer program product comprising:

first instructions for receiving graphics data for display, wherein the graphics data includes primitives defining lines;

second instructions for applying a gamma correction to the graphics data on a per primitive basis to form the antialiased lines, wherein the gamma correction is applied only to the primitives defining lines; and

third instructions for displaying the antialiased lines.

20. (Previously Presented) An apparatus comprising:

an input, wherein position information for a pixel is received at the input;

a coverage interpolation unit connected to the input, wherein the coverage interpolation unit generates a coverage valued at a first output in which the coverage value identifies how much of the pixel is covered at a first output;

an alpha interpolation unit connected to the input, wherein the alpha interpolation unit identifies a degree of transparency for the pixel as an opacity value at a second output;

a color interpolation unit connected to the input, wherein the color interpolation unit generates a red, green, and blue value for the pixel at a third output;

a gamma correction unit connected to the first output, wherein the gamma correction unit generates a gamma corrected value for the pixel using the coverage value at a fourth output, wherein the gamma correction unit only generates a gamma corrected value for pixels that are part of a line;

a modulate unit, wherein the modulate unit is connected to the second output and the fourth output, wherein the modulate unit adjusts the gamma corrected value to the opacity value to generate an adjusted gamma corrected value at a fifth output;

a frame buffer having a sixth output, wherein the frame buffer holds a final pixel value; and

a blend unit connected to the fifth output and the third output, wherein the blend unit blends the adjusted gamma corrected value and the red, green, and blue value for the pixel with a current pixel value from the sixth output of the frame buffer to form the final pixel value for display.

21. (Original) The apparatus of claim 20, wherein the gamma correction unit is connected to the first output of coverage interpolation unit by a clamp, wherein the clamp prevents values generated by the coverage interpolation unit from going out of a selected range of values.

22. (Previously Presented) A method in a data processing system for antialiasing lines for display, the method comprising:

generating graphics data for display;

determining whether the graphics data comprises a line;

if the graphics data comprises a line, sending the graphics data to an adapter;

applying a gamma correction to the graphics data to form an antialiased line.

23. (Previously Presented) The method of claim 22, wherein gamma correction is applied only to pixels generated for the line by a rasterization engine.